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Studies on Human Thyroid disorders based upon Assay of TSH and Thyroid Hormones in Ujjain, MP, India

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Abstract

In the present investigation, data were selected from exclusive Thyrocare hospitals CHL Apollo and J.K. Nursing home for Thyroid disorder in Ujjain, MP, India. Investigation shows that thyroid disorder is one of the serious health problem. Hypothyroidism is mostly described in human population; significantly it is more common in female, than males of different age groups. Thyroid disorder occurs mainly due to Iodine deficiency. Iodine found in cauliflower, cabbage, germinating seeds, soya bin oil, fish oil, eggs, milk, fast food such as poha, chocolates etc.

Keywords: Thyroid disorder hypothyroidism, hyperthyroidism, triiodothyronine (T3), thyroxine (T4) and thyroid stimulating hormone (thyrotropin-TSH).

Introduction

Thyroid disorder is a public health problem. The main role of thyroid is to regulate our basal metabolic rate (BMR). Thyroid produces two hormones: 80% thyroxine (T4), and 20% triiodothyronine (T3). In human being the normal range of T4 is 5 to 13.5 ug\dl (micro grams per deci litter) and TSH is 0.4 mU/L. The low and high secretion of hormone cause thyroid disorder, include hypothyroidism (HPO): cretinism, myxoedema, simple goitre, hashimoto's disease (autoimmune disease) and hyperthyroidism (HPR): Toxic goitre, thyroiditis, grav's disease[1-3]. In Ujjain, MP, India the prevalence of thyroid disorders are reported in different areas, various age, sex and religious groups.

Statistical Analysis: Probabilities of significant differences in the mean of thyroid disorder from different survey reports as well as in the hormone concentration. Significant level was determined by student-t test. Confidence limits were set at P= <.001 [4.]

Causes:- Too much or too little thyroid hormone, deficiency of iodine in body, abnormal thyroid growth, nodules or lumps within the thyroid gland, thyroid cancer. Symptoms: hypothyroidism- fatigue, weakness, weight gain, coarse dry hair, dry rough pale skin, hair loss, cold intolerance, muscle aches, constipation, irritability, memory loss, and abnormal menstrual cycles (figure 3-A,B). Hyperthyroidism: Sensitive to heat, hyperactive, eat excessively, toxic goitre, high temperature, increased heart beats, large eyes etc (figure-3 C)[5.]

Nutrition: The thyroid disorder occurs due to deficiency of iodine. Iodine rich diet includes: brassica vegetables- cabbage, cauliflower, fish oil, fast food- poha, chocolates, banana, milk, eggs, and other vitamin- E rich compounds. Which stimulate Iodine absorption such as soya bin oil, alfa-alfa, germinating seeds etc[6.]

Material and Methods

A total 876 human patients of both sexes were studied from exclusive Hospital 'CHL Apollo' and 'J.K. Nursing home' located in Ujjain, MP, India at Indore road.

The following are commonly used thyroid test: measurement of serum thyroid hormones: T4 testing by Radioimmunoassay (RIA) by RIA. Thyroid binding globulin (TBG). Pituitary production of TSH (Thyrotrophin) by immunoradio metric assay (IRMA). Thyrotrophin realising hormone (TRH) test. iodine uptake Scan. Thyroid antibodies, thyroid ultrasound. thyroid needle biopsy and thyroid scan[7-12].

Thyroid Scan are used for the following reasons: Identifying nodules and determining if they are "hot" or "cold". Measuring the size of the goitre prior to treatment. Follow-up of thyroid cancer patients after surgery. Locating thyroid tissue outside the neck, i.e., base of the tongue or in the chest.

Results and Discussion

The survey has been done on 876 patients and their age was between 1 to 80 Years. The survey was carried out from Nov.-2009 to Mach-2011. Information was collected about age, sex religious groups and hormone level (T4, T3 and TSH) etc. Thyroid disorder Occur due to iodine deficiency, and clearly more abundant in Female than Male (P=<0.001), as clearly shown by Figure-1and 2.

In present times 'TSH' test is very accurate and sensitive and can help to diagnose even the mildest cases of Hypothyroidism. According to "American Thyroid Association" the Standard TSH levels, show different thyroid conditions: - [all data in Milli units per litres (mu\l)]. The value of TSH are following- 0.4 mU\L Normal, 2.5 mU\L at risk (begging of Thyroid Disorder), 4.0 mU\L mild Hypothyroidism(HPO), and 10.0 mu\l

Hypothyroidism[13,14,15,] A complete data set become available from Female and Male are given in the following Tables 1and 2:- Children (0-10), Teenagers age (11-20), Younger age (21-30) (31-40) (41-50), Older age (51-60) (61-70) and (71-80) Years, as shown in Tables.

Thyroid disorder is a "Public Health Problem" in Ujjain, M.P. India. Researchers have carried out several Epidemiological survey on Thyroid disorders in different part of India. But there is no information available in the Malwa region of Madhya Pradesh, India[16.]

In Thyroid disorder Hypothyroidism is mainly reported and significantly more common in woman particularly those over age 50 Years (American Thyroid Association- 2009). In the present studies 876 Thyroid patients were studied. Data showing that Hypothyroidism is more common in Women than in Men, particularly those over age 41-50 Years. Woman developing Hypothyroidism is increased during pregnancy, after giving birth, and around the time of menopause[17-19.]

In 2009 'O' Pirhaji reported that subclinical Hypothyroidism has an effect on lipid pattern in blood with the resulting cardiovascular Dysfunction[20.]

Iodine is found in water and vegetable trace amount. Severe Iodine Deficiency result in impaired: Thyroid hormones synthesis and thyroid enlargement leads to goitre, iodine deficiency disorder (IDDs) include: Endemic goitre. Hypothyroidism, cretinism, decreased fertility rate, increased infant mortality, and mental retardation.

To protect from thyroid deficiency we should consume Iodized salt in micro quantity daily, and Indian govt there for made compulsory iodized salt for human population. Hypothyroidism occurs when thyroid gland under active and therefore produce low amounts of the thyroid hormones Triiodothyronine (T3) and Thyroxine, (T4) need thyroid hormone directly affect a following body activities: metabolic rates, energy production, brain activity, respiration heart beats, nervous system function's, body temperature, skin hydration menstrual periods and blood cholesterol level etc (American Thyroid Association).

Genetic defects: In rare cases the Genes that regulate Thyroid hormones may be damaged this directly affect Thyroid hormone production. Thus possibly causing Hypothyroidism most Genetic defect of Hypothyroidism are apparent at birth or early infancy. Though Hashimoto's Thyroiditis is the most common cause of Hypothyroidism and is detected with the help of Thyroid antibodies test: associated with a high level of Thyroid antibodies in the blood.

In present studies, more than 25-30 patients found which suffering from Hashimoto's Thyroiditis in Ujjain, M.P. India. Similarly Hashimoto's Thyroiditis is reported by "American Thyroid Association".

Conclusion

The present data show that in Ujjain, M.P. India Hypothyroidism is main problem particularly in women those over age 41-50. Significantly females are more commonly affected. Thyroid disease in human being is growing fast in India and also in Ujjain, for so many reasons find. There for, the present survey study provides important data, to the Govt and other agencies so is to control this problem in future in India.

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Table-1
for female shows Thyroid disorder in 'Human population'. In table- 1 also shows female male Vs comparative significante level (P=values)

Thyroid conditions and number. of patients							
Age group	**At risk 2.5 mU/L**	**Mild 4.0 mU/L**	**HPO 10.0 mU/L**	**HPR**	**Total**	**TSH average mU/L**	**Female Vs male P=Value**
0-10	11	03	01	00	15	4.54	>0.1
11-20	27	07	03	01	38	5.09	<0.25
21-30	98	36	06	03	133	5.53	<0.001
31-40	87	52	05	02	123	5.32	>0.001
41-50	89	57	07	00	153	3.45	>0.01
51-60	56	36	07	03	102	5.12	>.005
61-70	16	16	04	00	37	4.62	>0.1
71-80	12	03	02	00	10	4.28	<0.1
Total	396	210	35	09	652		

Table-2
for male shows Thyroid disorder in 'Human population'

Thyroid conditions and number of patients						
Age group	**At risk 2.5 mU/L**	***Mild 4.0 mU/L***	***HPO 10.0 mU/L***	***HPR***	***Total***	**TSH average mU/L**
0-10	04	01	00	01	06	2.59
11-20	07	03	00	01	11	2.64
21-30	19	05	02	00	27	2.64
31-40	24	07	06	05	40	5.36
41-50	41	14	02	00	57	3.48
51-60	29	10	02	00	41	3.97
61-70	16	07	03	00	26	5.89
71-80	12	01	01	00	24	>0.1
Total	152	48	16	07	223	

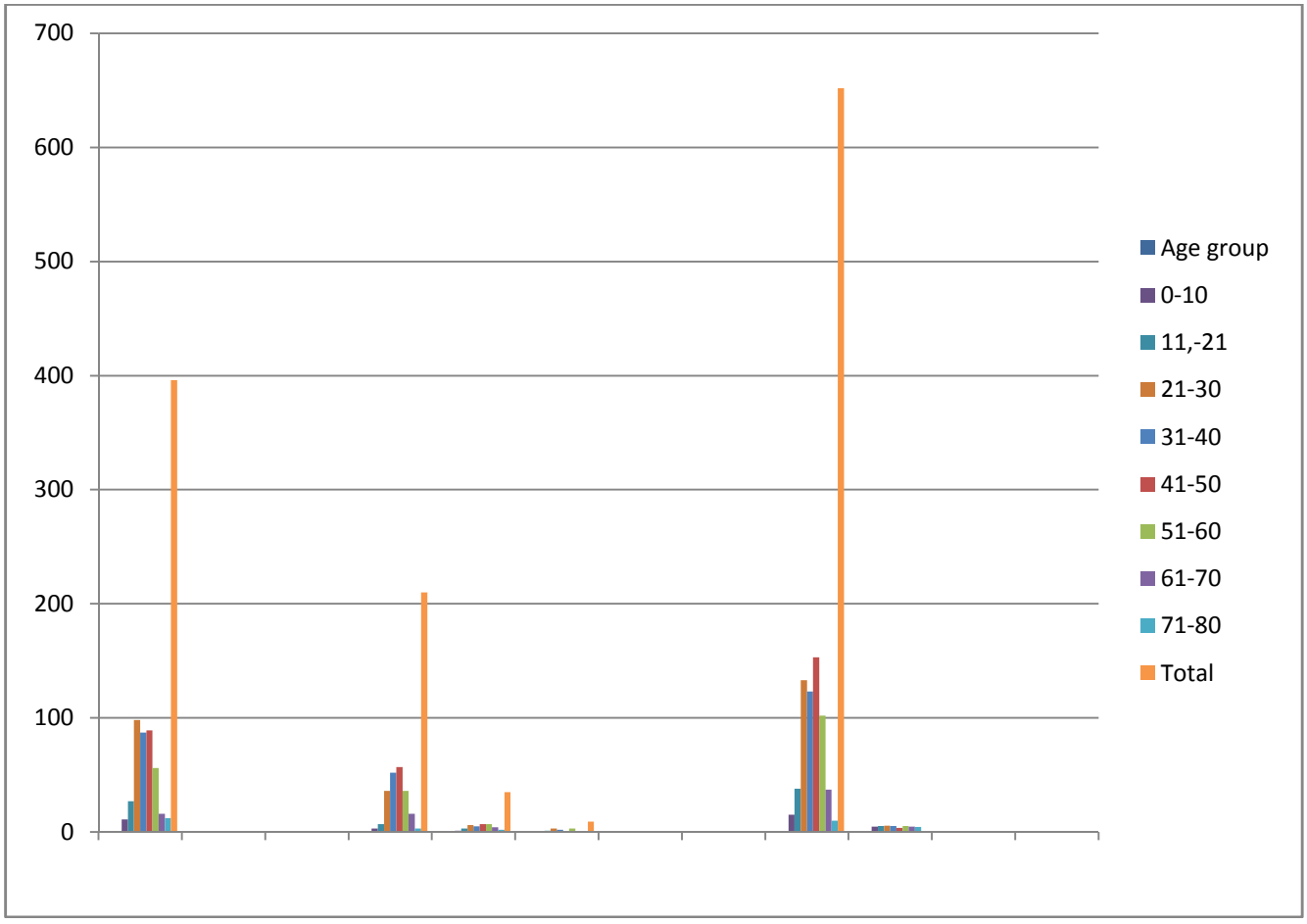

Figure- 1
Female thyroid conditions, the commonest age group affected by thyroid disorders was found 41-50 compared to other age group

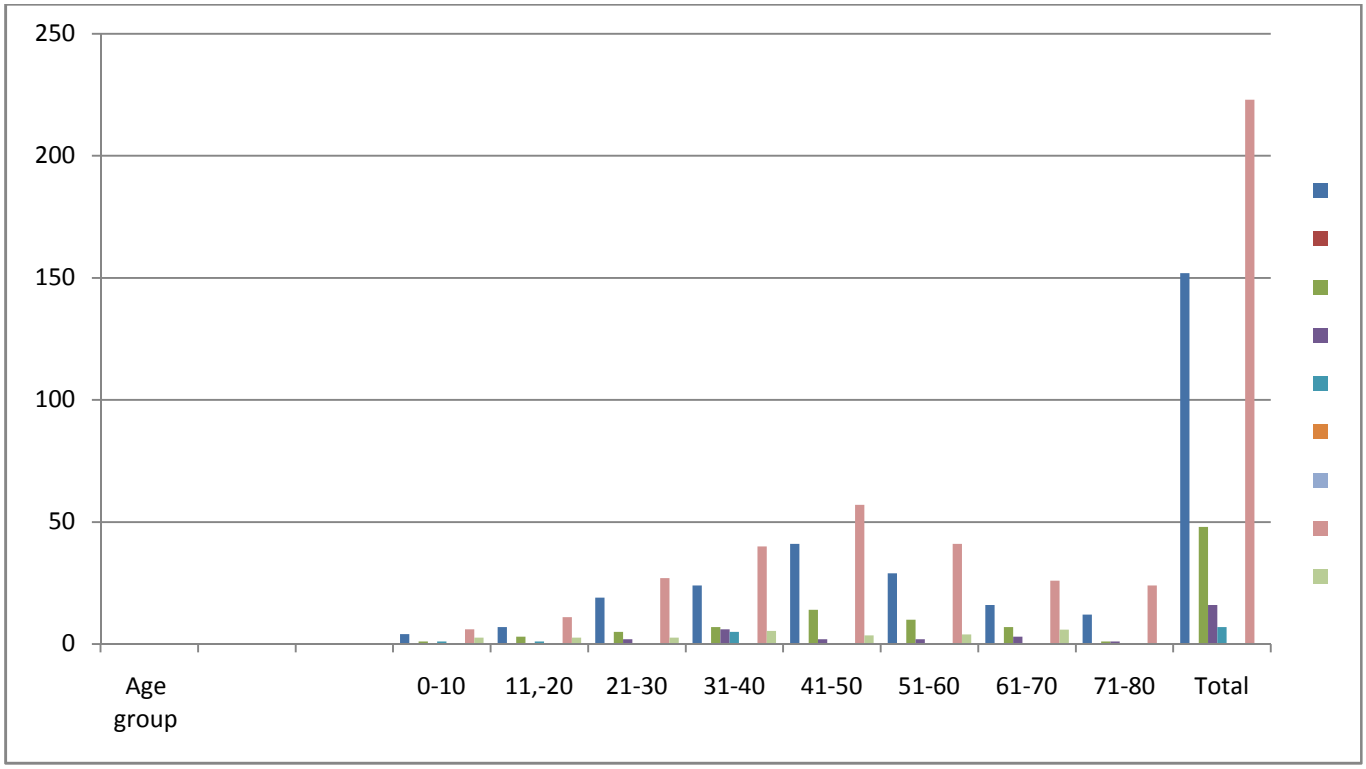

Figure -2
Male thyroid conditions, the commonest age group affected by thyroid disorders was found 41-50 compared to other age group

(A)	(B)	(C)

Figure-3
Hypothyroidism condition, (A) Goitre (B) yxoedema and (C) Hyperthyroidism- Exothermic goitre